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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/899,329	07/05/2001	Aull Robert S.	PCUS-059 (10380-2)	2607

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EXAMINER

SUCHECKI, KRYSZYNA

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/899,329

Applicant(s)

JOHNSON ET AL.

Examiner

Krystyna Suchecki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-26 and 30 is/are rejected.
- 7) ☒ Claim(s) 9, 10 and 27-29 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The Declaration filed on 09/09/03 under 37 CFR 1.131 is sufficient to overcome the Lail reference.

Claim Objections

2. Claim 30 is objected to because of the following informalities: claim 30 recites that the “ribbons in each stack comprises twenty-four optical fibers” and goes on to recite that an “additional optical fiber ribbon with a lesser number of optical fibers” is “disposed at at least one end of each stack”. This lends the interpretation that the additional optical fiber ribbon is a part of the first ribbon stack recited. The fiber count of the second fiber ribbon conflicts with the first mandate that the ribbon have twenty-four optical fibers. Appropriate correction is required, such as the introduction of a ribbon stack with an additional associated fiber ribbon. Examination will be based upon each fiber ribbon stack having an additional associated fiber ribbon.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5, 7-8, 11, 12, 14 and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan (US 6,192,178) in view of Applicant’s admission of the prior art (AAPA) and Nihei (JP 55-108604).

5. Regarding Claims 1-2, 8, 11 and 16 Logan teaches an elongated optical fiber cable with a longitudinal axis and with more than 1000 optical fibers (the combination of the cable assembly

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of Column 5, lines 15-21 with the fiber count of Column 3, lines 55-58 yields 1140 to 3000 fibers within the cable). By referencing US patent 5,621,841, Logan also teaches said cable comprising: a central strength member structure coaxial with the longitudinal axis (See Figure 1, combination of items 9, 23 and 24); a plurality of longitudinally extending buffer tubes (7) disposed around the central strength member structure in a single layer with each tube in contact with a pair of adjacent tubes and in contact with the strength member structure, the number of buffer tubes being greater than three and less than six (5 buffer tubes present) and each tube having a bore of a predetermined size; a plurality of optical fiber ribbons (8) in a stack in the bore of each of said tubes, each stack substantially filling, but being loosely received, in the bore of the tube in which the stack is received and each ribbon comprising a plurality of optical fibers in side-by-side relation and wherein the total number of optical fibers in the plurality of buffer tubes is greater than 1000; and a jacket (2) encircling the plurality of buffer tubes.

6. Logan fails to teach said cable having a fill factor not greater than about 85% in a two in. duct.

7. Applicant discloses that it is within the ordinary skill of one experienced in the art to design a cable with a fill factor of 80-85% or lower for the purpose of providing cable that is easier to thread or feed through a duct (Page 3). Applicant also states that 1.5 inch and 2.0 inch ducts are industry standard ducts and that it is preferential to maintain the use of the standard ducts in order to avoid replacement of the ducts (Pages 2-3).

8. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to ensure that the outside diameter of the cable of Logan could be fed through, and used with, a 1.5 or 2.0 inch duct with a fill factor of 80-85% or lower for the

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purpose of providing cable that is easier to thread or feed through a duct (Applicant, Page 3), avoiding replacement of the ducts (Applicant, Pages 2-3).

9. Regarding Claims 3 and 12, Logan teaches an optical fiber cable as set forth in claim 2 wherein each of the optical fiber ribbons in a stack (Figure 5, item 25a) received in at least one buffer tube contains the same number of optical fibers (Column 3, lines 34-63).

10. Regarding Claims 5 and 14, Logan teaches an optical fiber cable as set forth in claim 2 wherein some of the optical fiber ribbons in a stack received in at least one buffer tube contain fewer optical fibers than other optical fiber ribbons in the same stack (Column 3, lines 60-63).

11. Regarding Claim 7, AAPA discloses that a cable can be designed to have an 80-85% fill factor in a 1.5 inch duct. A cable so designed would have a fill factor of not greater than 75% in a 2 inch duct.

12. Regarding Claim 17, Logan teaches an optical fiber cable as set forth in claim 1 wherein the central strength member structure comprises a core (9) of high tensile strength material and an encircling layer of jacketing material (28).

13. Regarding Claim 18, Logan teaches an optical fiber cable as set forth in claim 1 wherein the central strength member structure comprises a core of high tensile strength material (9) and an encircling layer of water blocking material (23).

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14. Regarding Claim 19, Logan teaches an optical fiber cable as set forth in claim 1 wherein the central strength member structure comprises e-glass without an up-jacket Column 4, lines 3-13).

15. Regarding Claim 20, Logan teaches an optical fiber cable as set forth in claim 1 further comprising water blocking material within the jacket (25).

16. Regarding Claim 21, Logan teaches an optical fiber cable as set forth in claim 1 further comprising flexible strength members within the jacket and spaced from the central strength member structure (item 27).

17. Regarding Claim 22, Logan teaches an optical fiber cable as set forth in claim 1 wherein the buffer tubes are disposed around the central strength member structure in reverse alternating lay (Column 5, lines 6-9).

18. Claims 4, 6, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan and AAPA as applied to claims 3, 5, 12 and 14 above, and further in view of GR-20-CORE.

19. Regarding Claims 4, 6, 13 and 15, Logan teaches an optical fiber cable wherein some of the optical fiber ribbons contain twelve optical fibers (Figure 5, item 25a). Comparing, within Figure 2, stack 25a with stack 23, Logan implies a ribbon with 24 optical fibers.

20. Logan fails to explicitly teach an optical fiber cable wherein each of the ribbons in a stack received in at least one buffer tube contains twenty-four optical fibers and fails to explicitly teach an optical fiber cable wherein some of the optical fiber ribbons contain twelve optical fibers and some of the optical fiber ribbons contain twenty-four optical fibers.

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21. GR-20-CORE teaches that typical ribbon optical fibers accommodate 12 or 24 fibers in order to house several thousand fibers in a cable (Page 2-3, section 2.1.2.2).

22. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a ribbon optical fiber that accommodates 24 fibers in the cable of Logan in order to house several thousand fibers in a cable (GR-20-CORE, Page 2-3, section 2.1.2.2).

23. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Logan (US 6,192,178) in view of Applicant's admission of the prior art (AAPA) and Nihei (JP 55-108604).

24. Regarding Claim 23, 25 and 26, Logan teaches an elongated optical fiber cable with a longitudinal axis and with more than 1000 optical fibers (the combination of the cable assembly of Column 5, lines 15-21 with the fiber count of Column 3, lines 55-58 yields 1140 to 3000 fibers within the cable). By referencing US patent 5,621,841, Logan also teaches said cable comprising: a central strength member structure coaxial with the longitudinal axis (See Figure 1, combination of items 9, 23 and 24); a plurality of longitudinally extending buffer tubes (7) disposed around the central strength member structure in a single layer with each tube in contact with a pair of adjacent tubes and in contact with the strength member structure, the number of buffer tubes being greater than three and less than six and each tube having a bore of a predetermined size; a plurality of optical fiber ribbons (8) in a stack in the bore of each of said tubes, each stack substantially filling, but being loosely received, in the bore of the tube in which the stack is received and each ribbon comprising a plurality of optical fibers in side-by-side relation and wherein the total number of optical fibers in the plurality of buffer tubes is greater

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than 1000; and a jacket (2) encircling the plurality of buffer tubes. The ribbons re stacked so as to approximate a square shape (Figure 2). Logan also teaches that the tube assemblies can be used as a component in various fiber optic cable applications. Examples of mono-tube and multi-tube cables are given (Column 5, lines 15-25).

25. Logan fails to teach said cable having a fill factor not greater than about 85% in a two in. duct.

26. Logan also fails to teach the number of buffer tubes being four.

27. Applicant discloses that it is within the ordinary skill of one experienced in the art to design a cable with a fill factor of 80-85% or lower for the purpose of providing cable that is easier to thread or feed through a duct (Page 3). Applicant also states that 1.5 inch and 2.0 inch ducts are industry standard ducts and that it is preferential to maintain the use of the standard ducts in order to avoid replacement of the ducts (Pages 2-3).

28. Figure 2 of Nihei teaches an optical fiber cable with stacked ribbon optical fibers (2). The cable comprises four buffer tubes (10) about a central member (11). The buffer tubes are further jacketed (13). In combination with the square-shaped stacking of the ribbon optical fibers, the four tube assembly offers a strong cable design.

29. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to ensure that the outside diameter of the cable of Logan could be fed through, and used with, a 1.5 or 2.0 inch duct with a fill factor of 80-85% or lower for the purpose of providing cable that is easier to thread or feed through a duct (Applicant, Page 3), avoiding replacement of the ducts (Applicant, Pages 2-3). Further, it would have been obvious to select a cable design within the range taught by Logan, such as the four tube structure of Nihei,

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since Logan's design offers a high fiber count capacity in a square-shaped stacking arrangement that would benefit by a strong cable design when arranged in four tubes around a central strength member as taught by Nihei.

30. Regarding Claim 24, Applicant discloses that a cable can be designed to have an 80-85% fill factor in a 1.5 inch duct. A cable so designed would have a fill factor of not greater than 65% in a 2 inch duct.

31. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Logan, AAPA and Nihei as applied to claim 23 above, and further in view of GR-20-CORE.

32. Regarding Claim 26, Logan teaches an optical fiber cable wherein some of the optical fiber ribbons contain twelve optical fibers (Figure 5, item 25a). Comparing, within Figure 2, stack 25a with stack 23, Logan implies a ribbon with 24 optical fibers. The ribbons in each stack can have the same number of fibers in each ribbon, or the stacks can comprise a variety of ribbon counts (Column 3, line 35- Column 4, line40). As above, Logan also teaches an optical fiber cable with more than 1800 optical fibers, and, as combined with AAPA, teaches a fill factor that is not greater than 85% in a one-and one-half inch duct.

33. Logan fails to explicitly teach an optical fiber cable wherein each of the ribbons in each stack comprises twenty-four optical fibers, wherein the cable comprises additional optical fiber ribbons with a lesser number of optical fibers and which are disposed at at least one end of each stack.

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34. GR-20-CORE teaches that typical ribbon optical fibers accommodate 12 or 24 fibers in order to house several thousand fibers in a cable (Page 2-3, section 2.1.2.2).

35. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a ribbon optical fiber that accommodates 24 fibers in a stack as taught by Logan in order to house several thousand fibers in a cable (GR-20-CORE, Page 2-3, section 2.1.2.2).

Allowable Subject Matter

36. Claims 9-10 and 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

37. The following is a statement of reasons for the indication of allowable subject matter:

Claims 9 and 27 contain allowable subject matter for at least the reason that the prior art fails to teach or suggest an elongated optical fiber cable with a longitudinal axis and with more than 1000 optical fibers, said cable having a fill factor not greater than about 85% in a two inch duct and comprising a plurality of buffer tubes with a plurality of optical fiber ribbons within the buffer tubes and further having additional optical fibers in the interstices of the optical cable as claimed.

Conclusion

38. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent to Bringuier (US 5,684,904) is of interest for showing a combination of fiber ribbons and loose tube fibers in an optical cable. Bringuier offers no motivation to place the

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loose tube fiber arrangements within interstices between the cable jacket and ribbon optical fiber buffer tubes as set forth by Applicant.

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703) 305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

40. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

41. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

ks


DAVID V. BRUCE
PRIMARY EXAMINER